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ABSTRACT

Recognizing that rote drill and practice (rehearsal) has been replaced with game-like teaching formats as a tool for memorization, a study compared the effectiveness of the two methods to teach eight preschoolers to recite their home telephone numbers. In six sessions, children either rehearsed their phone numbers or used small props and rhyming phrases as mnemonic devices to assist their learning. Findings showed that more of the children who rehearsed their phone numbers could recite them on posttests and retention tests conducted two, four, and six weeks after training. Those children who used props and rhyming phrases seemed unable to remember their phone numbers because of interference from the mnemonic techniques. It was concluded that the "fun" teaching techniques used by teachers of young children inhibited, rather than facilitated, learning. (HOD)

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PLAYING GAMES AT SCHOOL: AN ANALYSIS OF TEACHING WITH A GAME[1]

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Short title: Teaching with a Game

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ABSTRACT

This brief report describes a pilot research project that compared rote drill, or practice, and a game-like approach as methods to teach preschoolers to recite their home telephone numbers. In six sessions, children either rehearsed their phone numbers or used small props and rhyming phrases as mnemonic devices to assist their learning.

The data indicate that more of the children who rehearsed their phone numbers could recite them on posttests and retention tests conducted two, four, and six weeks after training. Those children who used props and rhyming phrases seemed unable to remember their phone numbers because of interference from the mnemonic techniques. It is possible that the "fun" teaching techniques used by teachers of young children also inhibit, rather than facilitate, learning.

PLAYING GAMES AT SCHOOL: AN

ANALYSIS OF TEACHING WITH A GAME

Beginning in the preschool years, we memorize strings of numerals, letters, and words. "A, B, C, D, E, F, G,..." goes a favorite song used as a tool to help children memorize a string of 26 letter names. "One little, two little, three little Indians," "The ants go marching one-by-one," and numerous other tools are used to help children memorize a string of ten numeral labels in a fixed order -- one, two, three, four, five, six, seven, eight, nine, ten. Both of these difficult letter and numeral strings are memorized by most children by four years of age. Later, between the ages of four and six, many children are asked to memorize their home telephone numbers and addresses. For older children, throughout the school years, committing strings of words to memory is integral to education as we know it; multiplication tables and the pledge of allegiance are common examples. Braga and Braga (1975) point out that memorization of numerals, letters, and words is a simple, common process for most adults. Most persons have a large accessible repertoire of phone numbers, addresses, birthdays, identification numbers, and even song lyrics!

Recently rote drill and practice, or rehearsal, as a tool, for memorization has been replaced with board games, computer games, and other game-like teaching formats in an expanding trend in elementary school classrooms (Hohmann, 1984; Robinson, 1983; Chaffin, 1982; Hermann, 1976; Humphrey, 1969). Teachers are encouraged to make their own boardgames or to buy commercially-made games in teacher-education courses, professional magazines, in-service workships, and conference presentations. Although rote learning has been popular in schools in the past, a contemporary concern for student apathy has led to the proliferation of more "exciting"

learning tools. In an attempt to capture the imagination and interest of children reared on sophisticated media techniques, teachers have increasingly abandoned simple rehearsal as a teaching tool.

In this article, we will describe some pilot data examining the effectiveness of a game-like teaching format, as compared to simple rehearsal, using recitation of preschool children's home telephone numbers as the memorization task. The game components were chosen with the intent of closely approximating the learning games currently popular among teachers of young children. Therefore, concrete objects were used, the procedure involved the children motorically, and a mnemonic memory device was incorporated. Rhymed words were chosen as the mnemonic technique since they were believed to be more meaningful for young children than other common mnemonics, such as the initial-letter cues used to teach the notes of the treble staff in music (Every Good Boy Deserves Favor = E, G, B, D, F). It was hoped that manipulation of concrete objects, paired with associated rhyming phrases, would allow the children to form mental images which would then facilitate recall.

REHEARSAL VS THE GAME

An informal classroom assessment identified eight children (mean age 4-1) who did not know their home telephone numbers. These children were divided equally into two groups, for either rehearsal or rhyming game activities. Children were taken individually to a small room adjacent to their preschool classroom for their training, and were given a more formal test to ensure that they could not recite their phone numbers.

Figure 1 shows the cardboard and plastic props used for the game and their corresponding mnemonic rhymes and motor responses. No materials were required for the rehearsal training.

Insert Figure 1 about here

In both types of training the seven digits of the phone number (e.g. 842-3486) were progressively chained in units, as follows: the three-digit exchange was unit one (842), the next two digits were unit two (34), and the final two digits were unit three (86). Each unit was trained in two sessions, making a total of six training sessions.

At the start of each training session the unit(s) being trained were modeled for the child, and seven trials of the training followed: "Your number is 842. What's your number? (With child) 842." For children receiving game training the rhymes and motor responses, using miniature simulated props, for use with the prop materials were also modeled. The teacher verbalied the rhymed phrases with the children on early trials as a prompt (e.g. "842, Shine the shoe.") The rhymed phrase and motor responses (e.g., child gave several strokes with a brush on a small shoe) for a unit were faded over that unit's two training sessions. When the second unit was trained with a rhyme and motor responses, the first unit without its rhyme and motor responses preceded the second unit (e.g. "842-34, Open the door."). The third unit was trained in the same way.

... WHICH IS BEST?

After six training sessions each child was tested again, immediately, and then two, four, and six weeks later to check for retention. On the first test after training, three of the four children trained with rehearsal alone correctly recited their phone numbers and four out of these four recited it correctly on the first and second retention tests. (One child was incorrect by one digit on 2 out of 3 responses on the first

posttest, but the teacher felt the child really "knew" the phone number). Only two of the four children trained with the game could correctly recite their phone numbers on these three tests. On the third retention test three out of four of those trained with rehearsal and only one out of four of those trained with the game still remembered their phone numbers correctly.

The teacher attempted to determine if the game training was more fun for children than the rehearsal training by offering each child the opportunity for another training trial at the conclusion of each training session ("Do you want to do it one more time?") It is guessed that all children consistently chose the extra trial because just being alone with the teacher for the training was pleasant for them. However, the teacher noticed that children involved in the game training seemed to enjoy it less than children in the rehearsal training (they smiled less and seemed more nervous), perhaps because this training involved more responding and children were more likely to make errors.

CONCLUSIONS

The data collected during the training indicate that the children who used rehearsal to memorize their phone numbers completed their training with fewer errors, were more likely to learn their phone numbers, and were more likely to remember them, as compared with children who used the game. For these latter children the telephone number digits appear to have become "lost" in the game-like training process; they were able to remember the props and rhymes but could not remember their phone numbers. These children had more to learn than the children using rehearsal and this may have strong implications for the usefulness of learning games. It seems that the game approach to education used in this study "stacked the deck"

against the children. It may be that children in the early elementary grades are also susceptible to interference from the game components which are intended to help them learn. Even simple games require more learning than rehearsal because one must learn the rules and procedures of the game as well as whatever the game is designed to teach (e.g. color names in Candyland).

Hastings (1977) stated that memorization is often blamed for the frustrations of students. However, this accusation may be unjust because children in this study acquired the phone number responses successfully by rote rehearsal. Perhaps this old method will be more palatable to some if it can be "modernized" by the use of peer-tutor and computer-assisted instructional techniques. Commercial learning games or ideas for teacher-made games are tempting to teachers who hope to add the motiviation of fun to learning situations. With the recent media hue and cry about the academic incompetence of many supposedly educated children, it is imperative that empirical studies be generated to examine more closely the effectiveness of learning games and other contemporary educational practices to which young children are being exposed. The results of such studies might contribute to a "new" trend in education -- back to the inclusion of rote methods.

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FOOTNOTES

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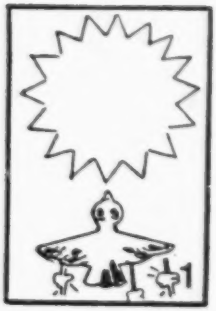
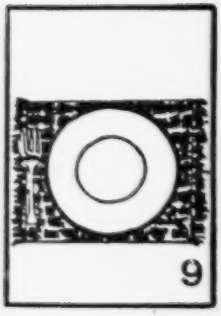
Figure I. Show a schematic picture of each prop for all numerals. The motor and verbal responses for the props were as follows: (1) the bird was moved around the sum while saying, "Circle the sun."; (2) the brush was moved back and forth across the toe of the shoe as the subject made the verbal response, "Shine your shoe."; (3) the doll was moved the length of the pan, above the water, while verbalizing, "Swim the sea."; (4) the door was pulled open while saying, "Open the door."; (5) the bee was placed inside the box as the subject verbalized, "In the hive."; (6) the sticks were touched together while verbalizing, "Tap the sticks."; (7) the subject turned the picture around while saying, "This is Mr. Kevin."; (8) the gate was pushed closed as the subject verbalized, "Shut the gate."; (9) the subject lifted the spoon as though eating and said, "Now we dine."; (0) pronounced "oh." The rake was moved across the table's surface with the verbalization, "Dig and hoe."





Dramatic–Play Props